19. (New) The wave field microscope as recited in claim 16 wherein the illumination or excitation system has at least one further real or virtual illumination source for light beams capable of coherence or at least one further beam splitter for decoupling at least one beam component and a further objective lens through which the light wave trains are focused into the object space and are aligned in such away that they interfere with the light wave trains from the same or from the other or two other spatial direction so that the one or two-dimensional wave field form a two- or three-dimensional wave field.

20. (New) The wave field microscope as recited in claim 12 in that the object space includes an object mount fixture, in or on which an object is rotatably supported with measuring structures.

21. (New) The wave field microscope as recited in claim 20 further comprising at least one calibration target in the wave field, the object capable of being a rotated 360 degrees for at least one axis.

22. (New) The wave field microscope as recited in claim 12 wherein the illumination sources producing the multi-dimensional wave field, and/or the reflector(s), and/or the beam splitter(s), and/or the objective lens(es) and, thus, the multi-dimensional wave field, are rotationally mounted about one or two axes running orthogonally with respect to one another.

23. (New) The wave field microscope as recited in claim 12 wherein provision is made in the detection system for a scanner reflector, which is arranged so as to be suitable for forming an image of the lateral object regions with the desired, preferably maximal, fluorescence intensity.

24. (New) The wave field microscope as recited in claim 12 wherein the illumination system includes in at least one of the three spatial directions, a real illumination source for the two- or multi-photon excitation, and in one or both other spatial direction(s), a real and/or virtual illumination source for the two- or multi-photon excitation, and that the standing wave fields generated with it have wavelengths which differ from one another, and have distances between their specific wave maxima or wave minima of $d_1 = \lambda_1/2n \cos \theta_1$ or $d_2 = \lambda_2/2n \cos$